

Appl. No. *To be assigned*; Filed: October 17, 2003;  
Dkt. No. 2072.0010006/LBB/SJE; Group Art Unit: *To be assigned*; Inventor: Michelle M. Hanna; Tel: 202/371-2600  
Title: Molecular Detection Systems Utilizing Reiterative Oligonucleotide Synthesis

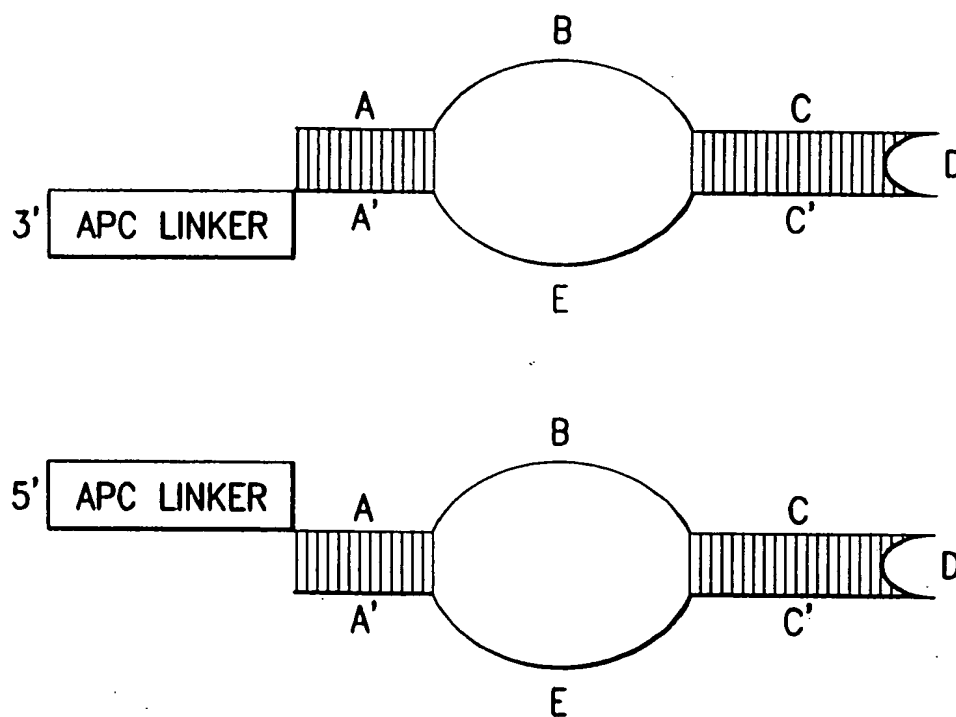
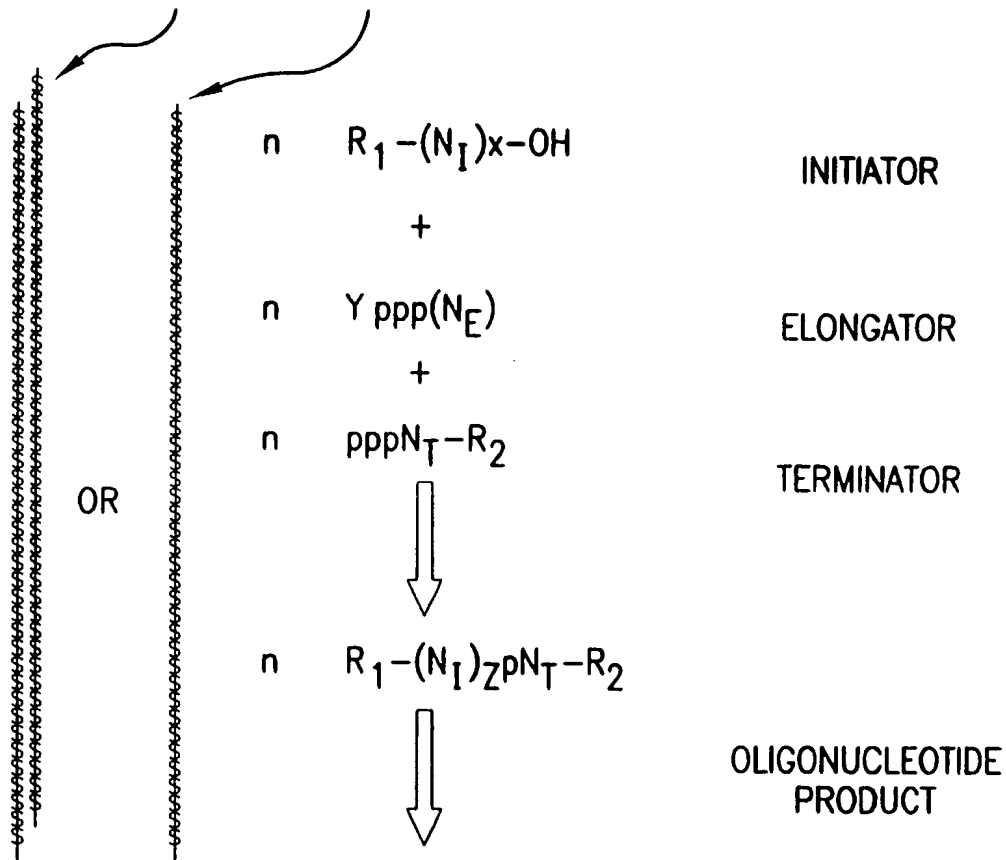


FIG.1

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DOUBLE STRANDED OR SINGLE STRANDED DNA OR RNA



MULTIPLE SIGNALS

FIG.2

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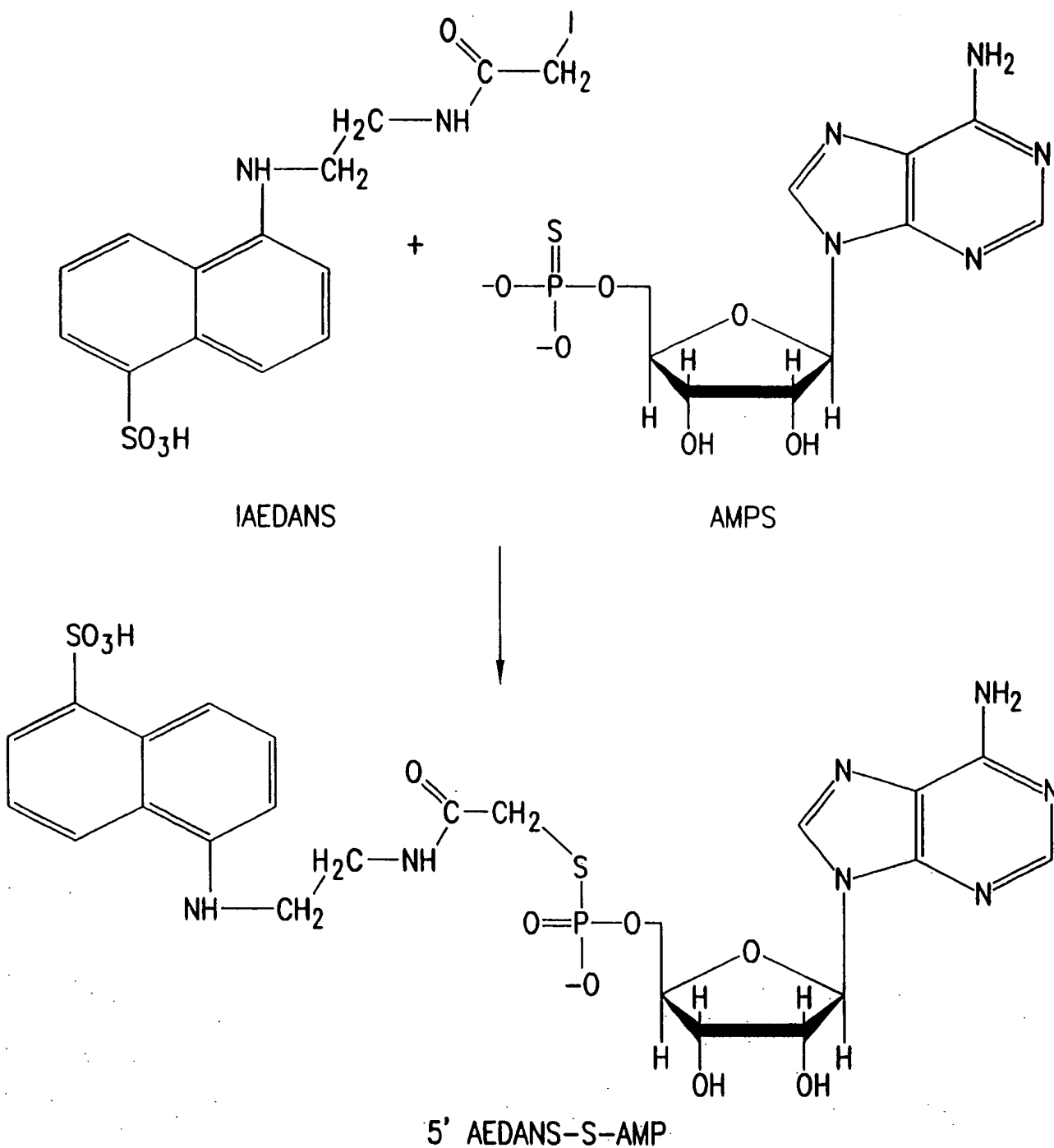


FIG.3

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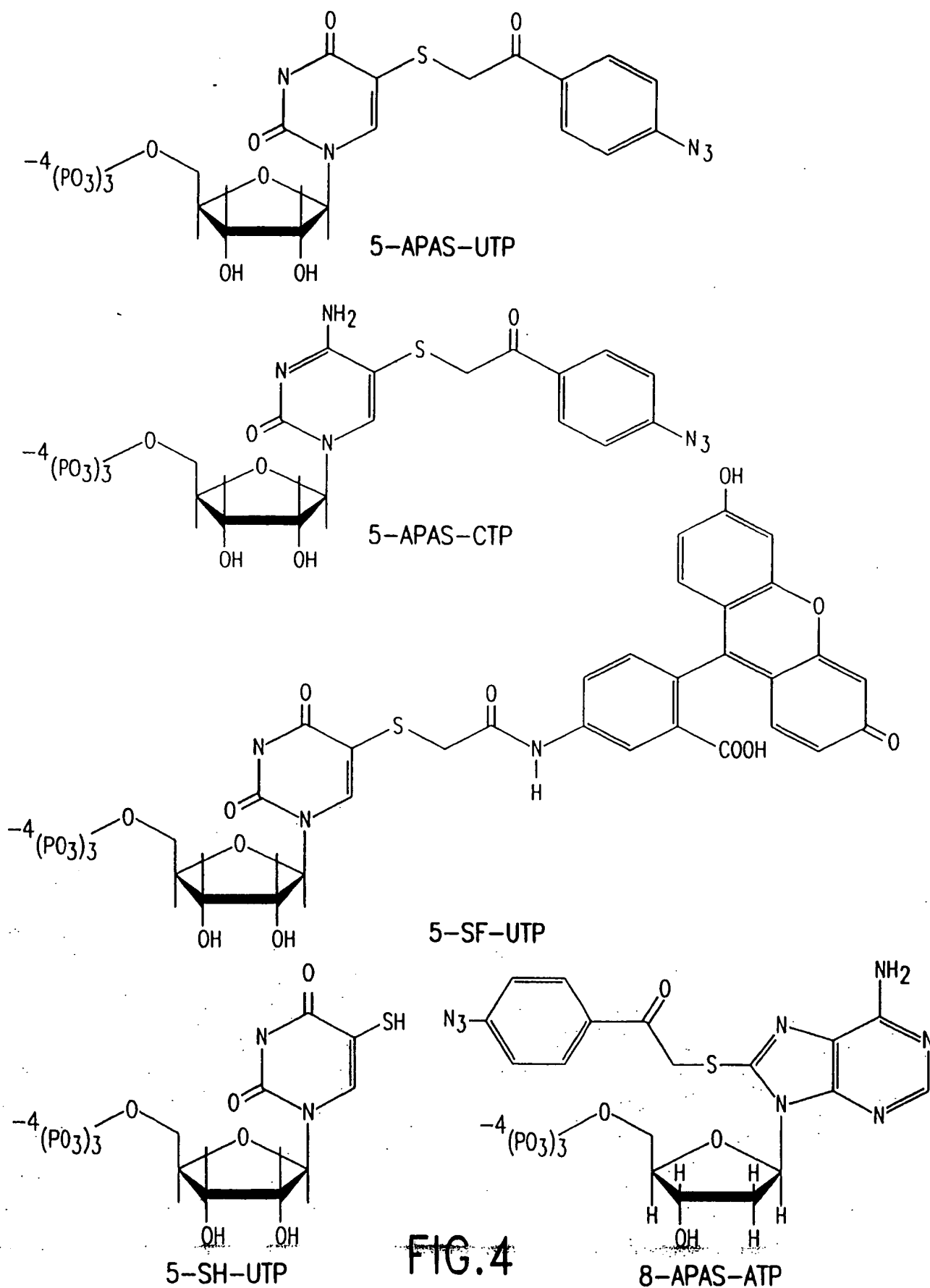
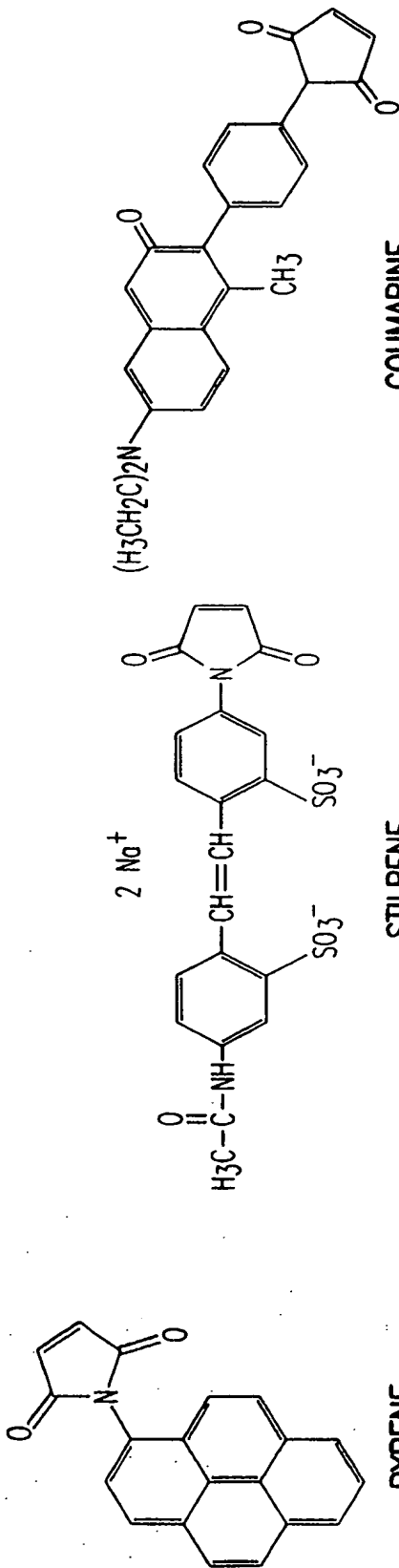
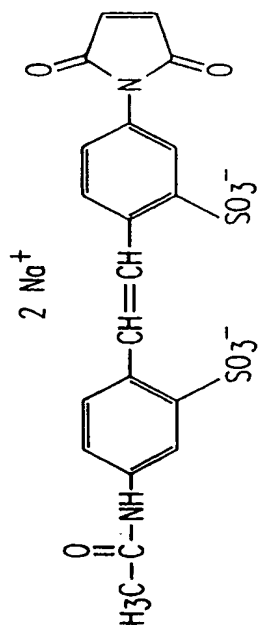


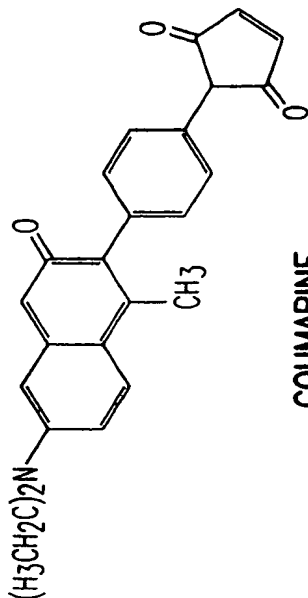
FIG. 4



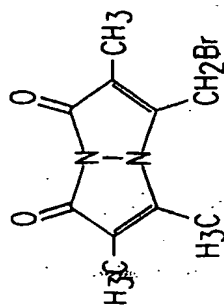
PYRENE



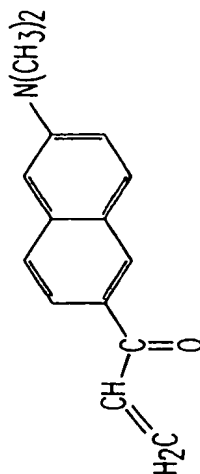
STILBENE



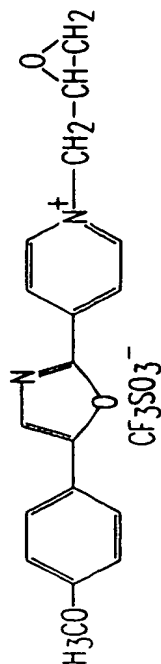
COUMARINE



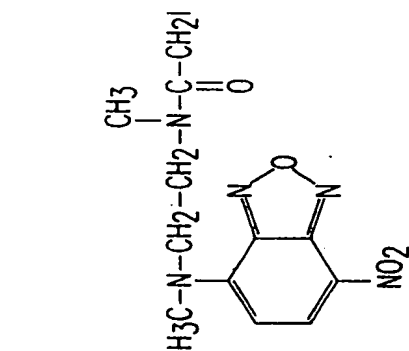
BIMANE



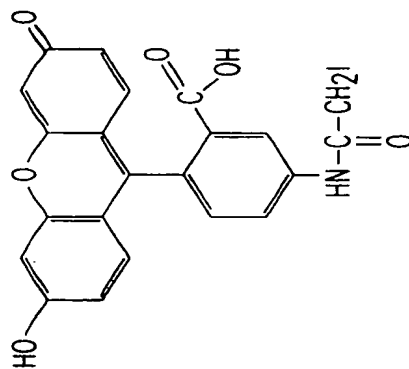
NAPHTHALENE



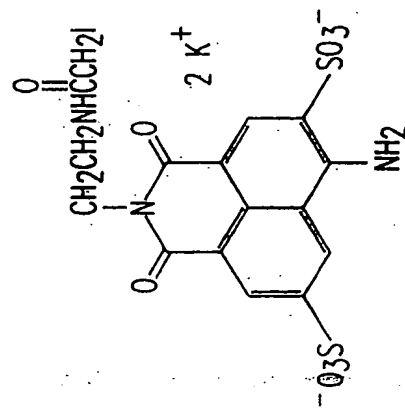
PYRIDYLOXAZOLE



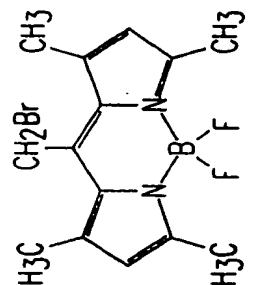
NBD



FLUORESCEN



NAPHTHALIMIDE



BODIPY™

FIG.5

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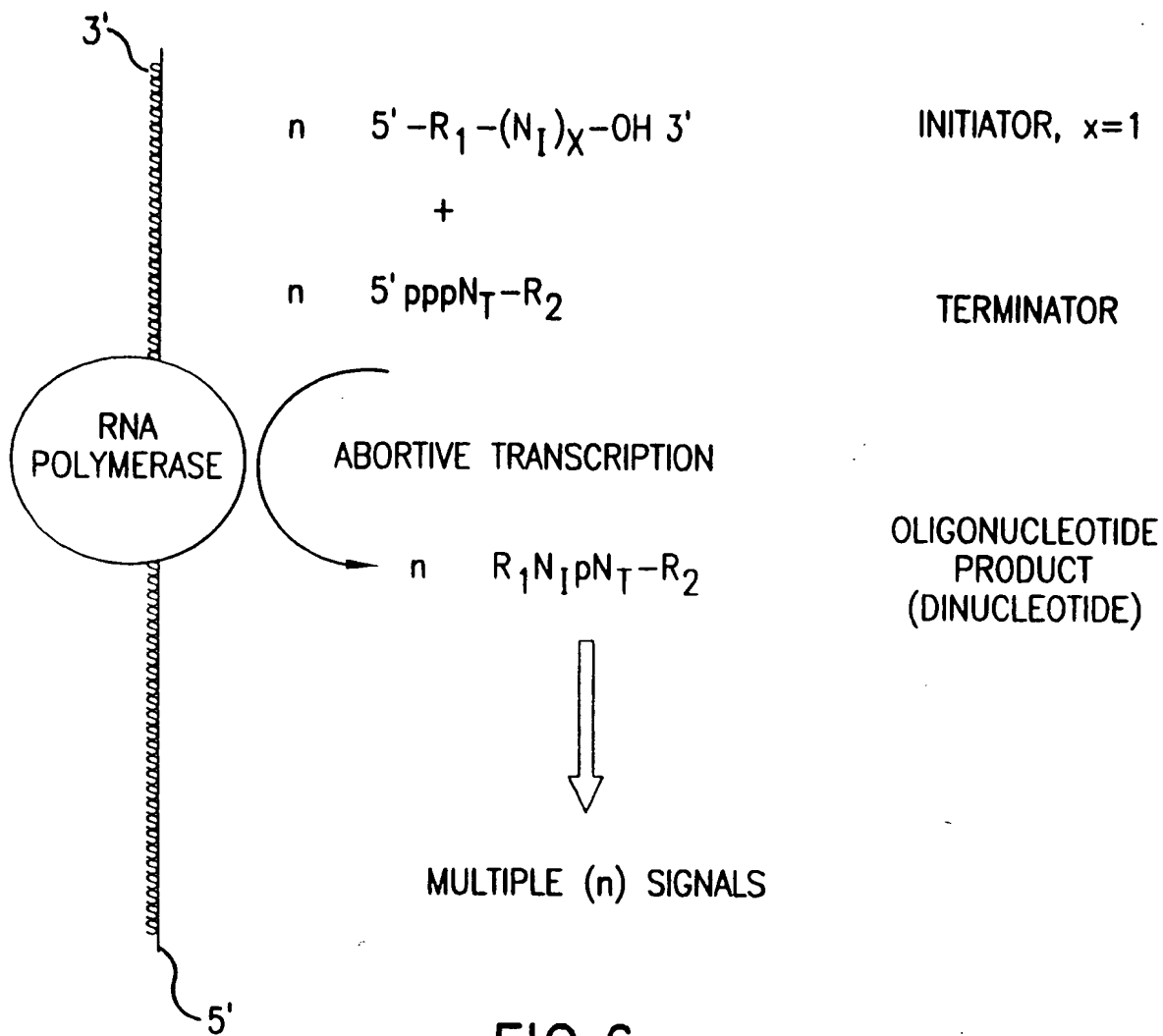
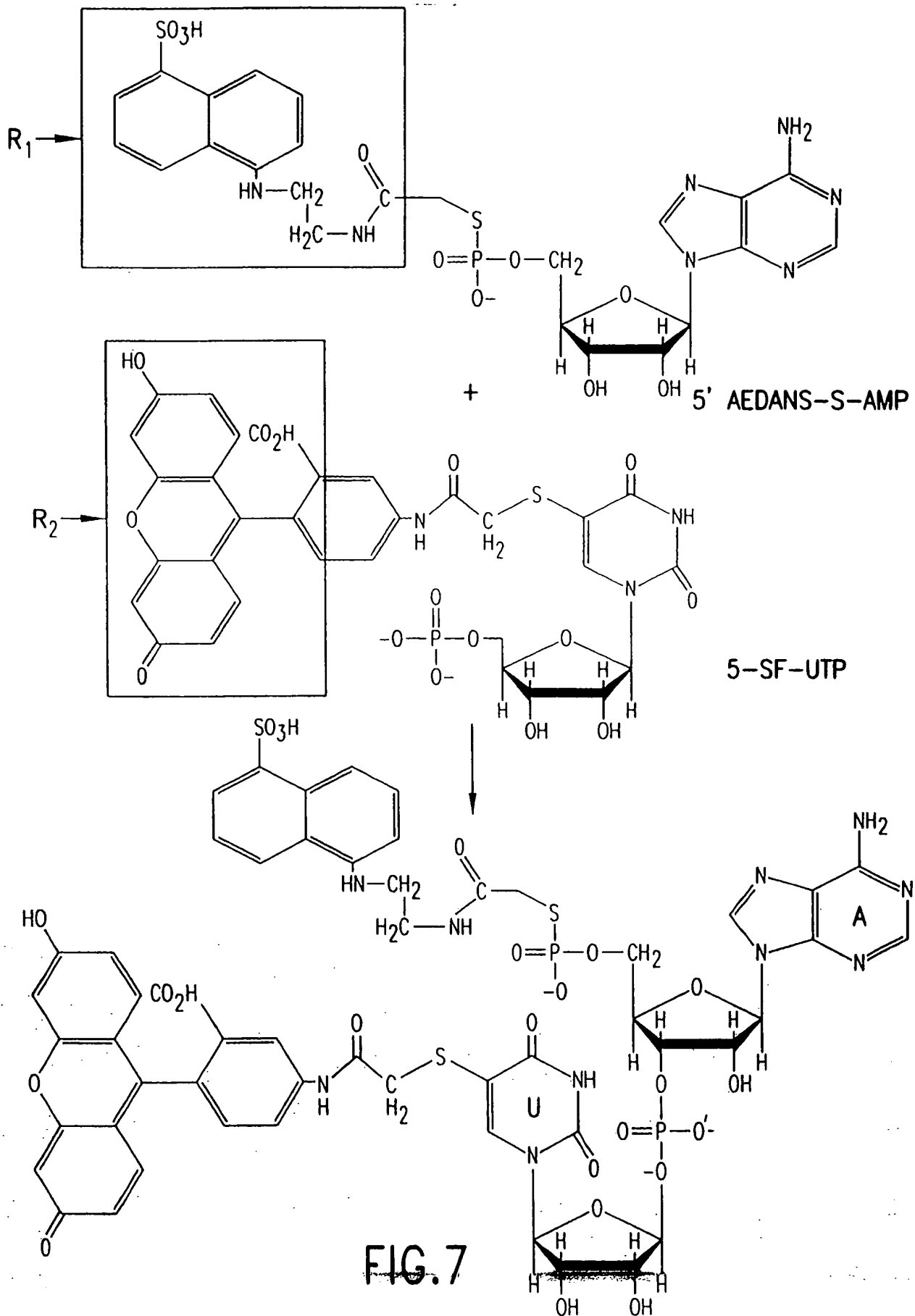


FIG.6



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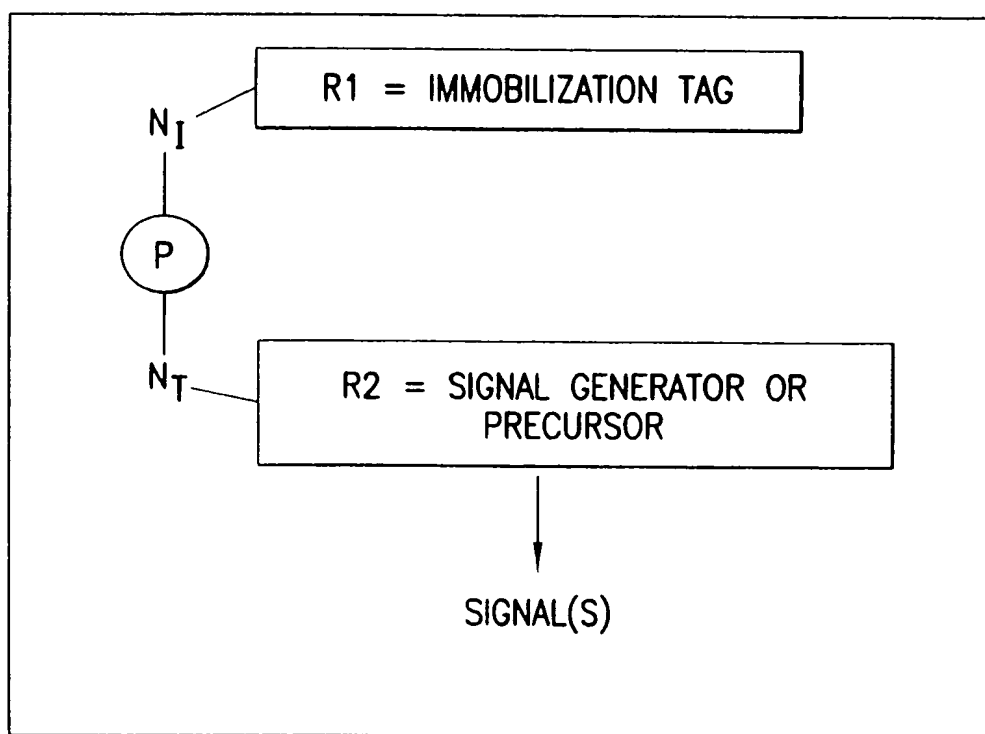


FIG.8



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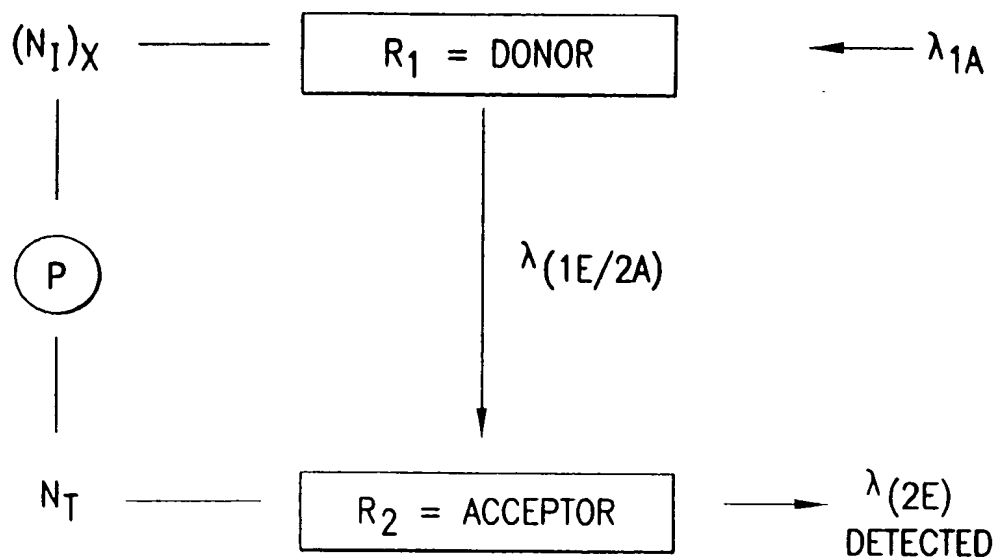


FIG.9

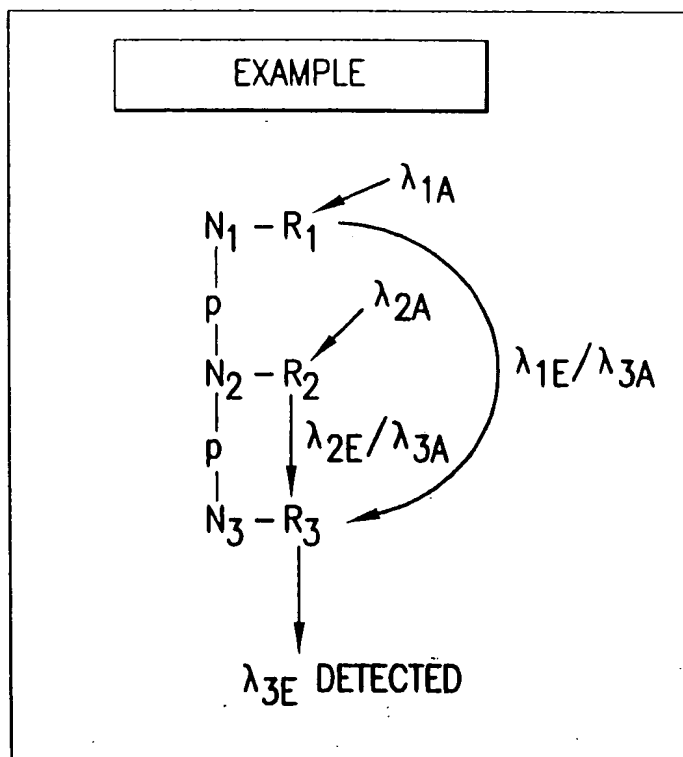
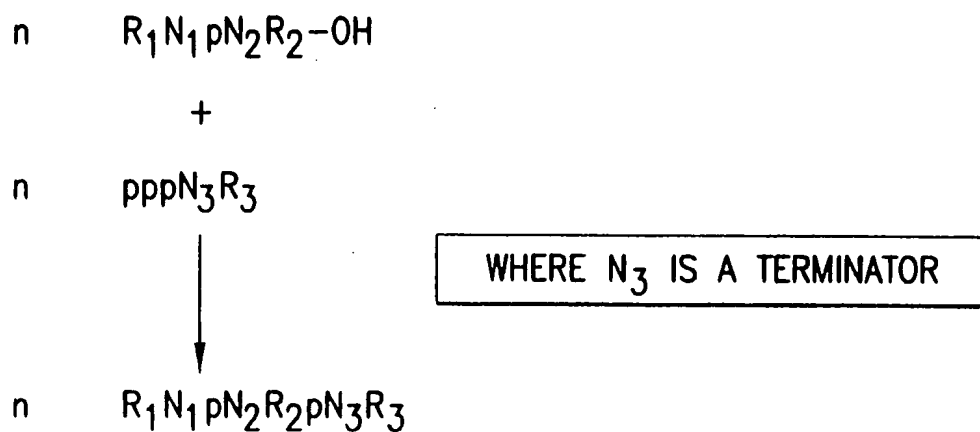


FIG.10

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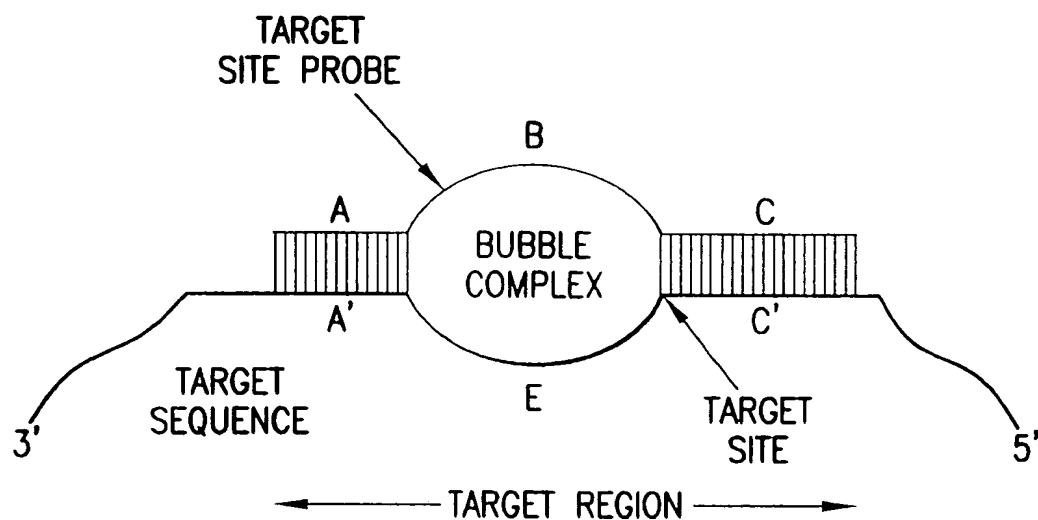


FIG.11

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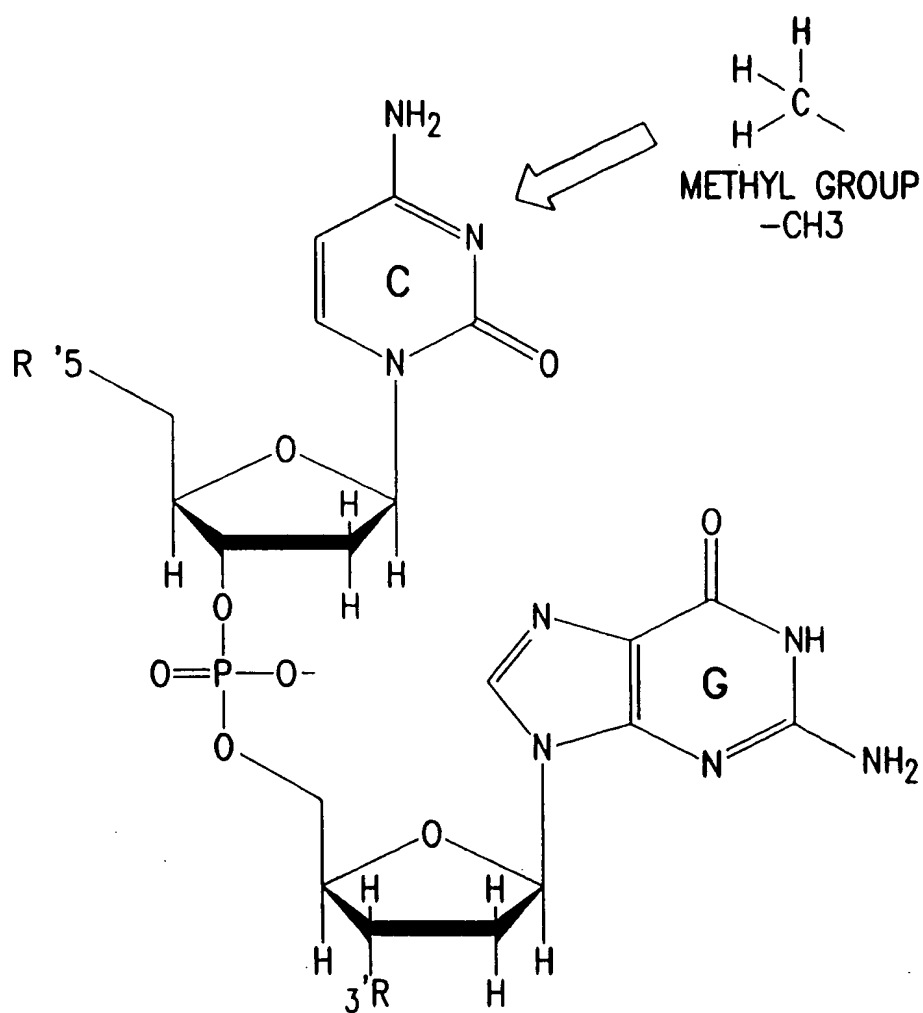


FIG.12

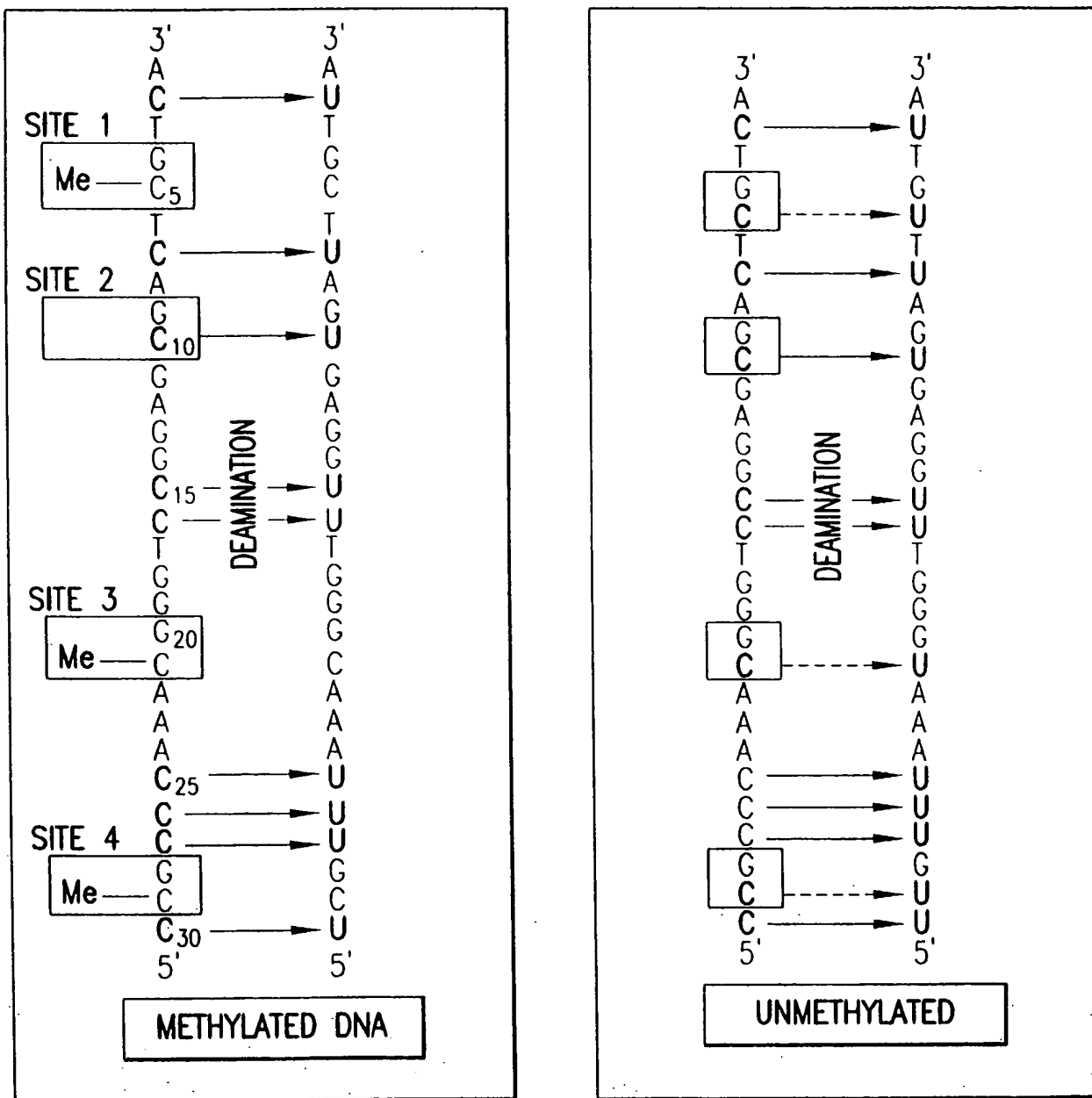


FIG.13

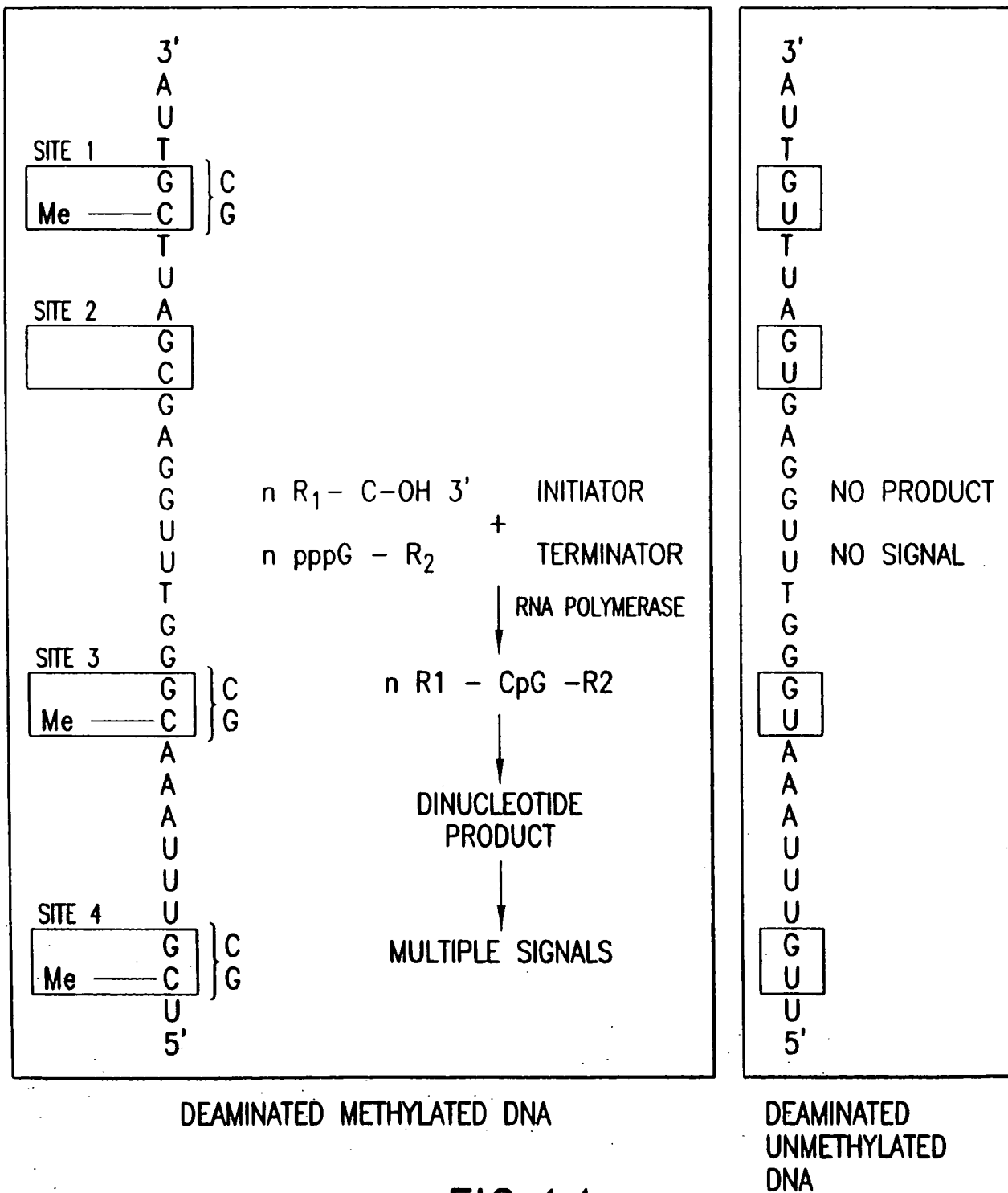
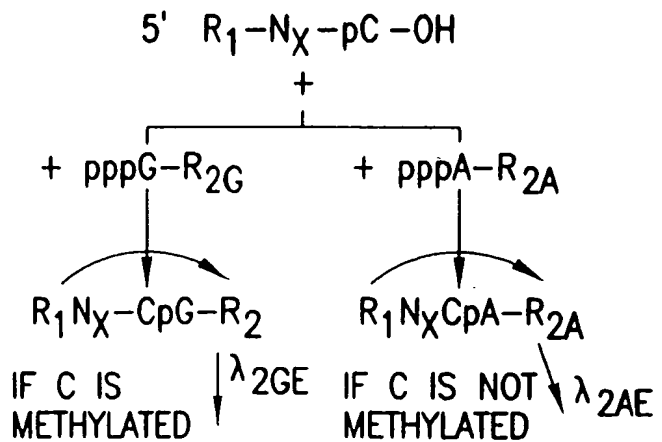


FIG.14



M=1 IF BOTH COPIES ARE 100% METHYLATED: ONLY  $\lambda_{2GE}$  DETECTED

M=0.5 IF 1 COPY IS METHYLATED: BOTH  $\lambda_{2GE}$  AND  $\lambda_{2AE}$  DETECTED

M=0 IF BOTH COPIES UNMETHYLATED: ONLY  $\lambda_{2AF}$  DETECTED

$$M = \text{METHYLATION INDEX} = \frac{E\lambda_{2GE}}{E\lambda_{2GE} + E\lambda_{2GA}}$$

FIG. 15

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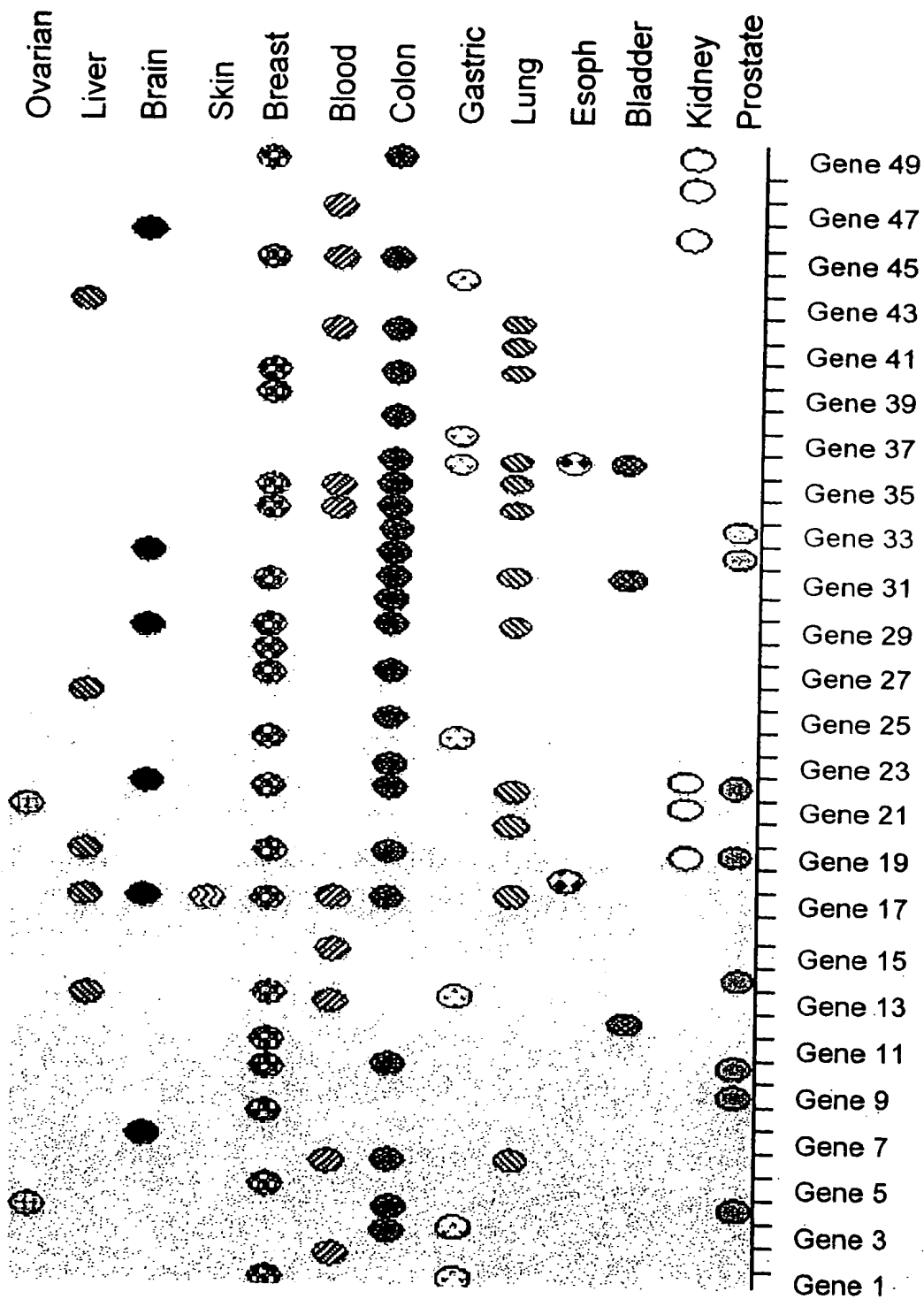


FIG. 16



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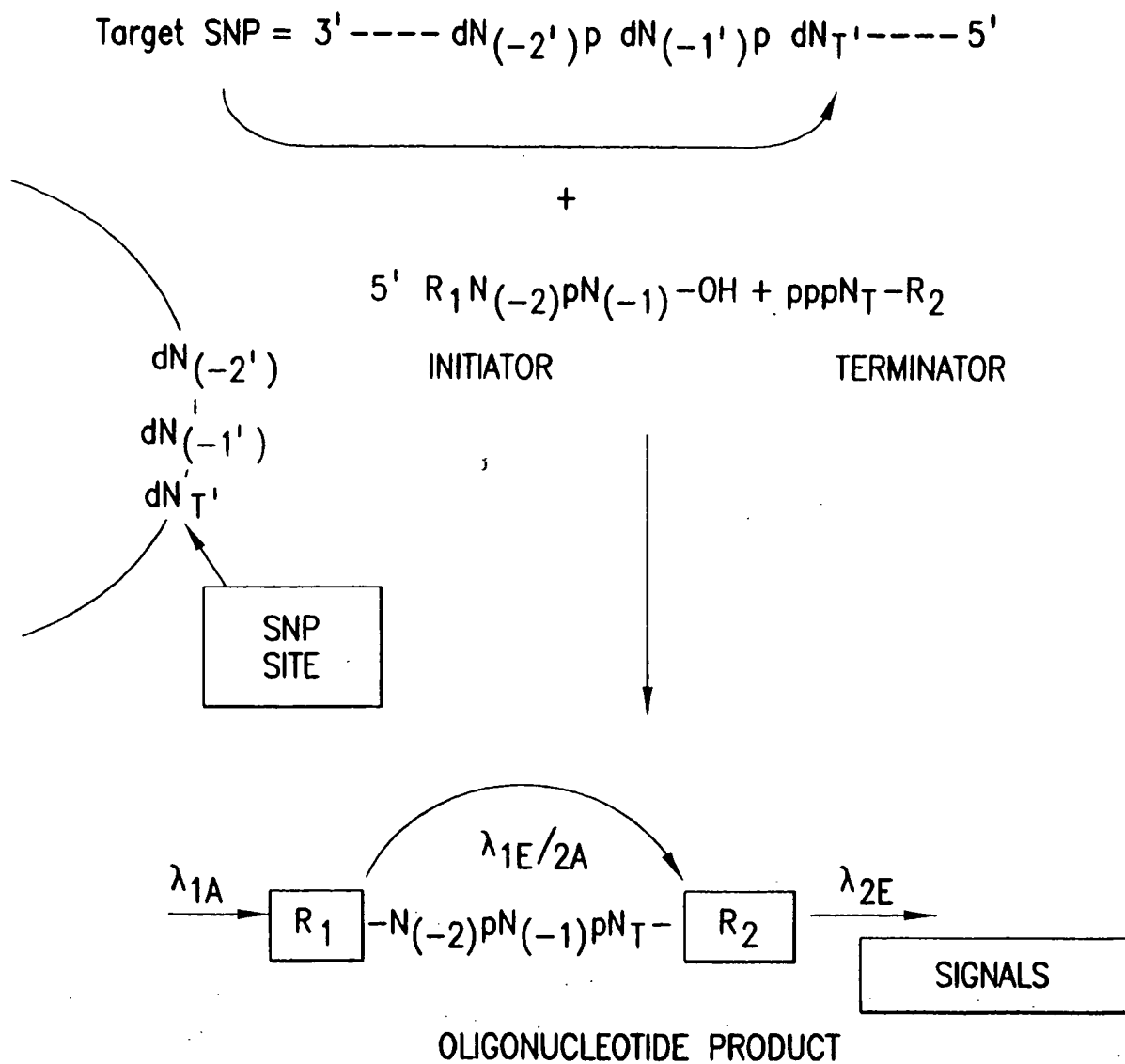


FIG.17

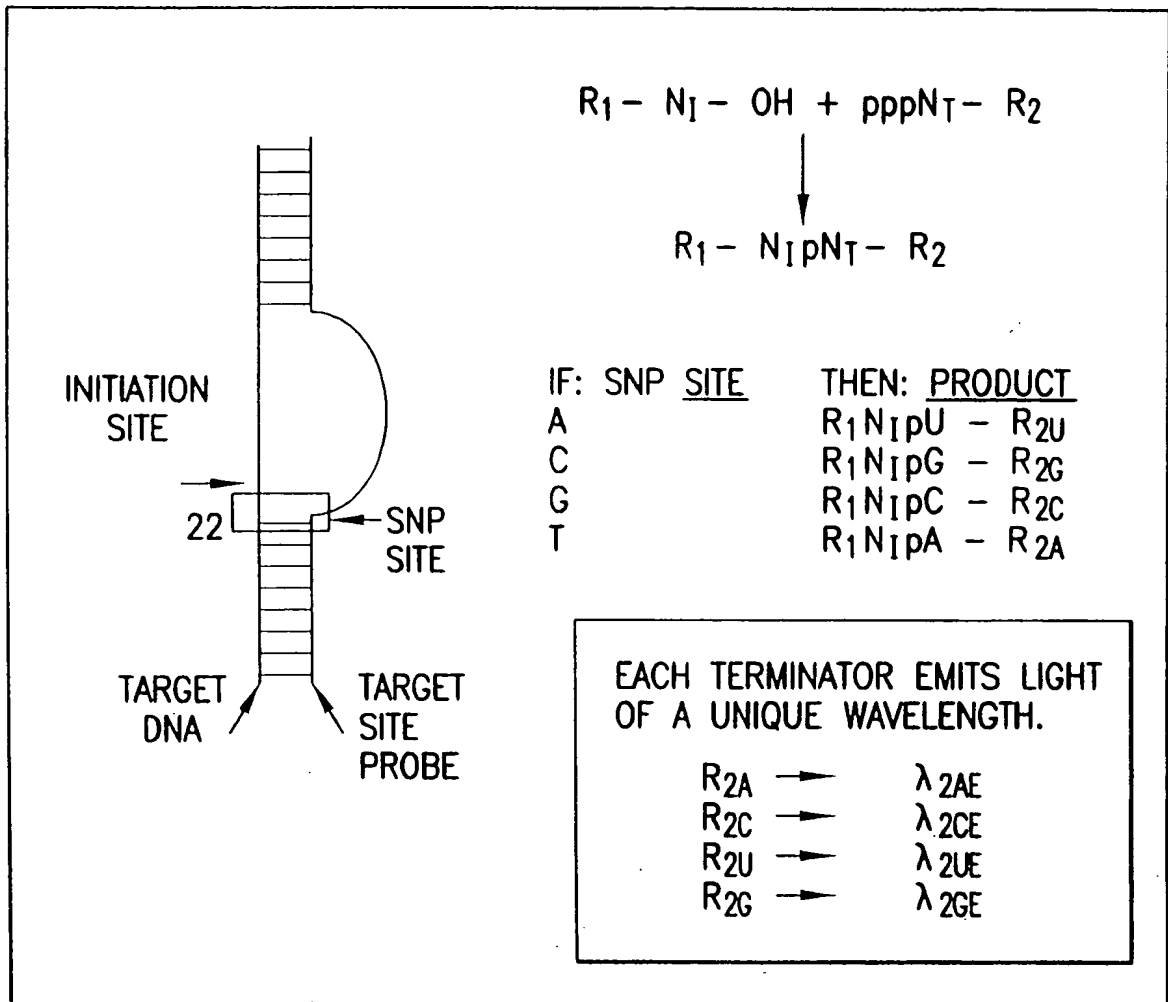


FIG.18

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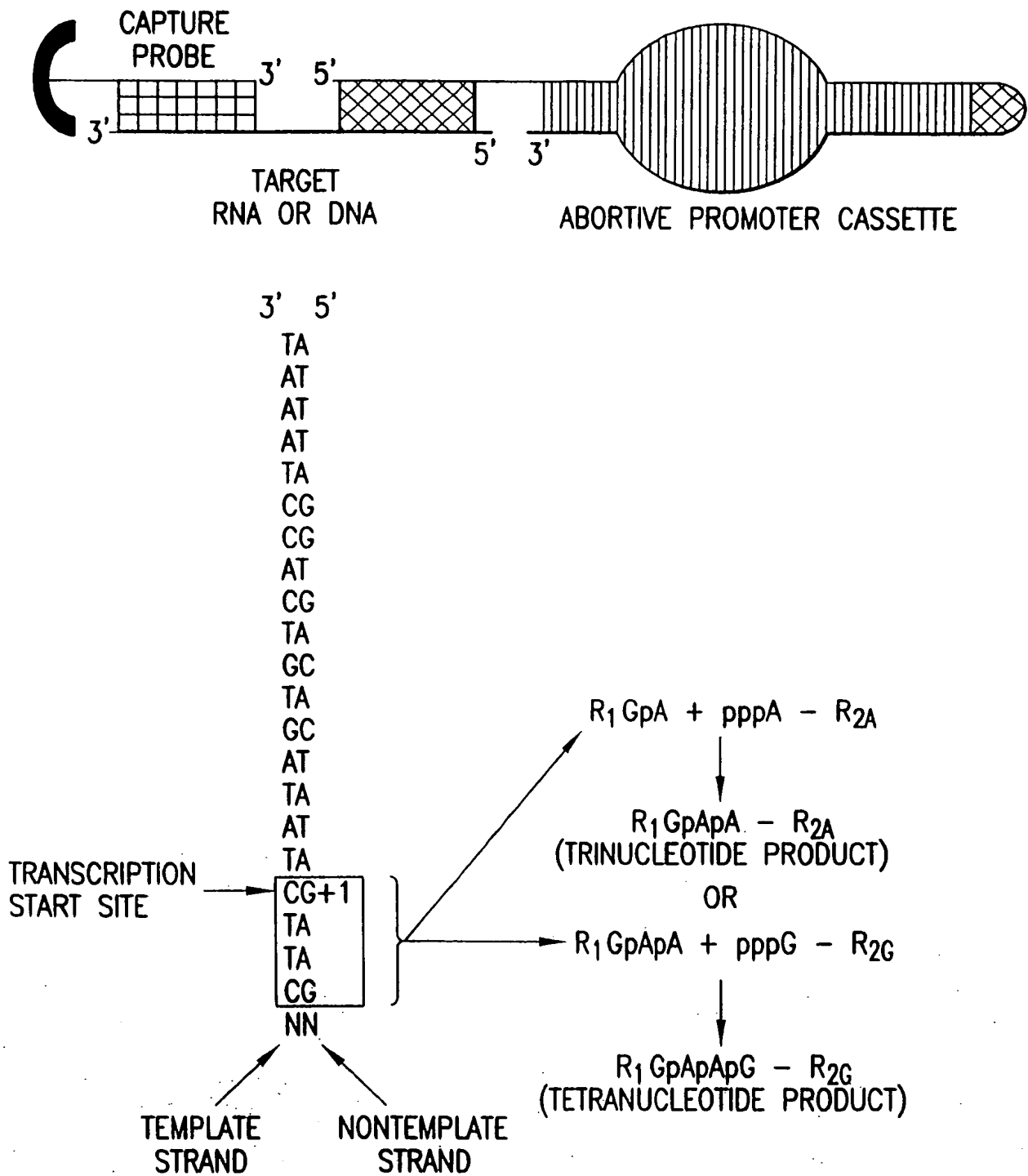


FIG.19

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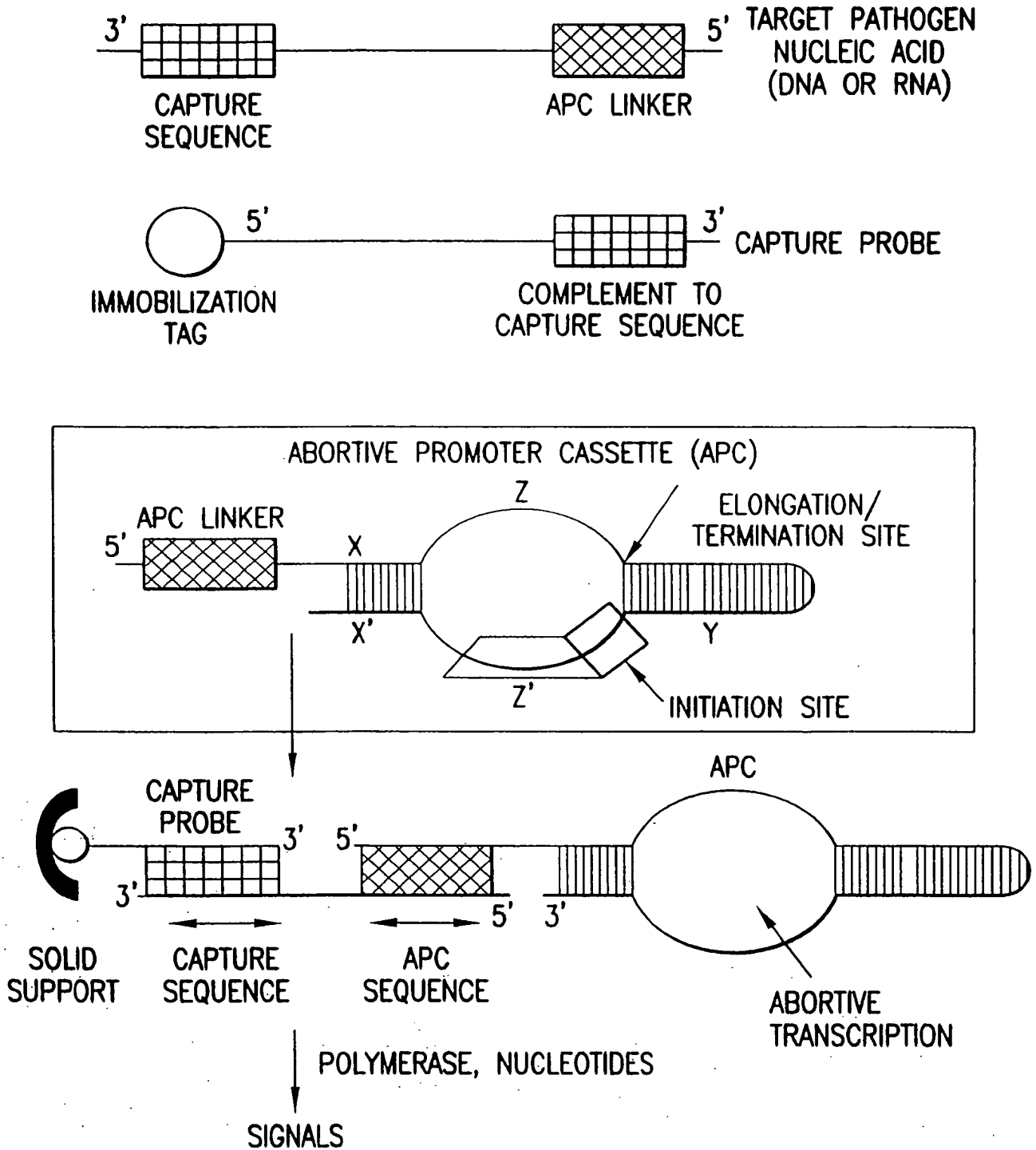


FIG.20

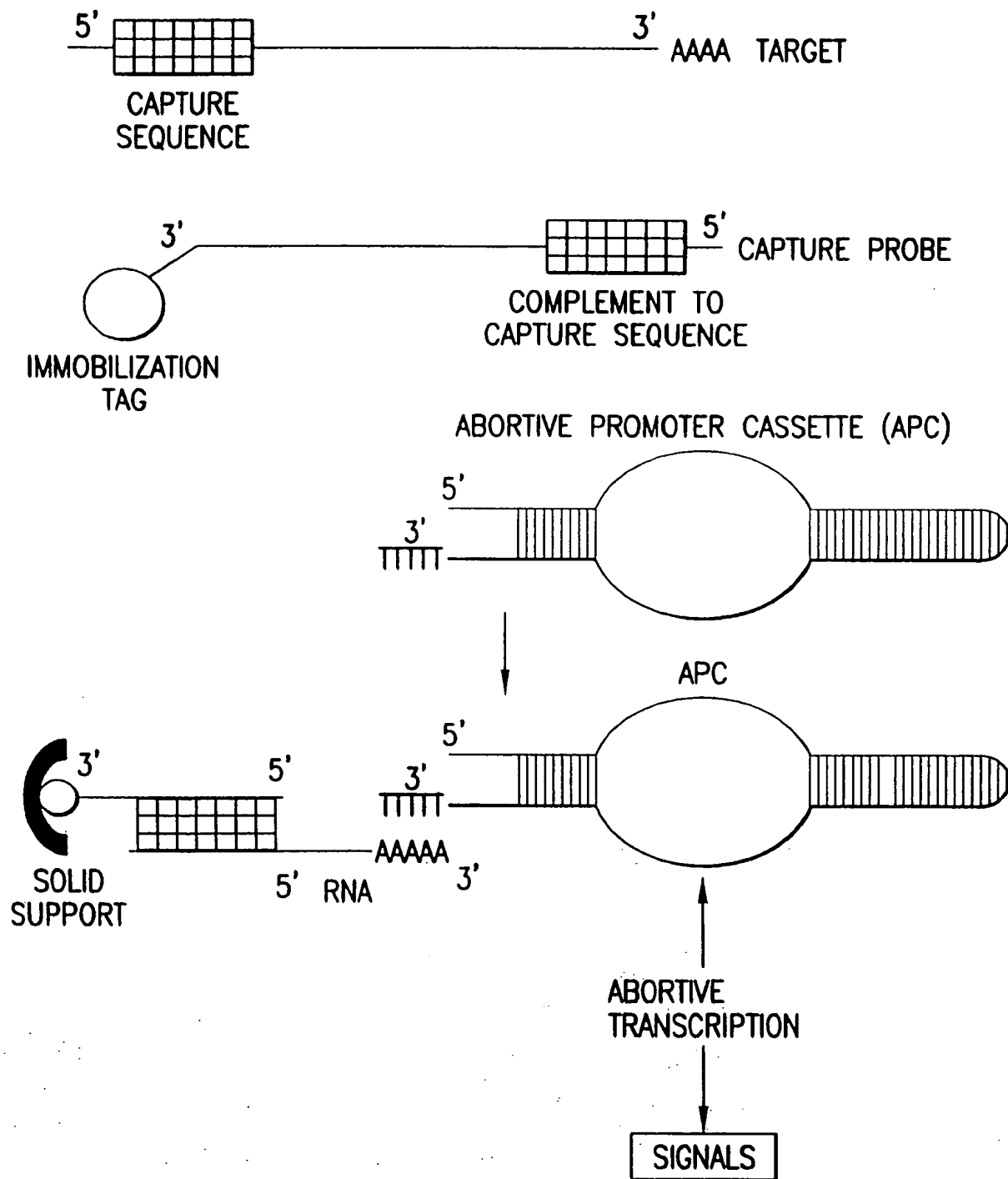


FIG.21

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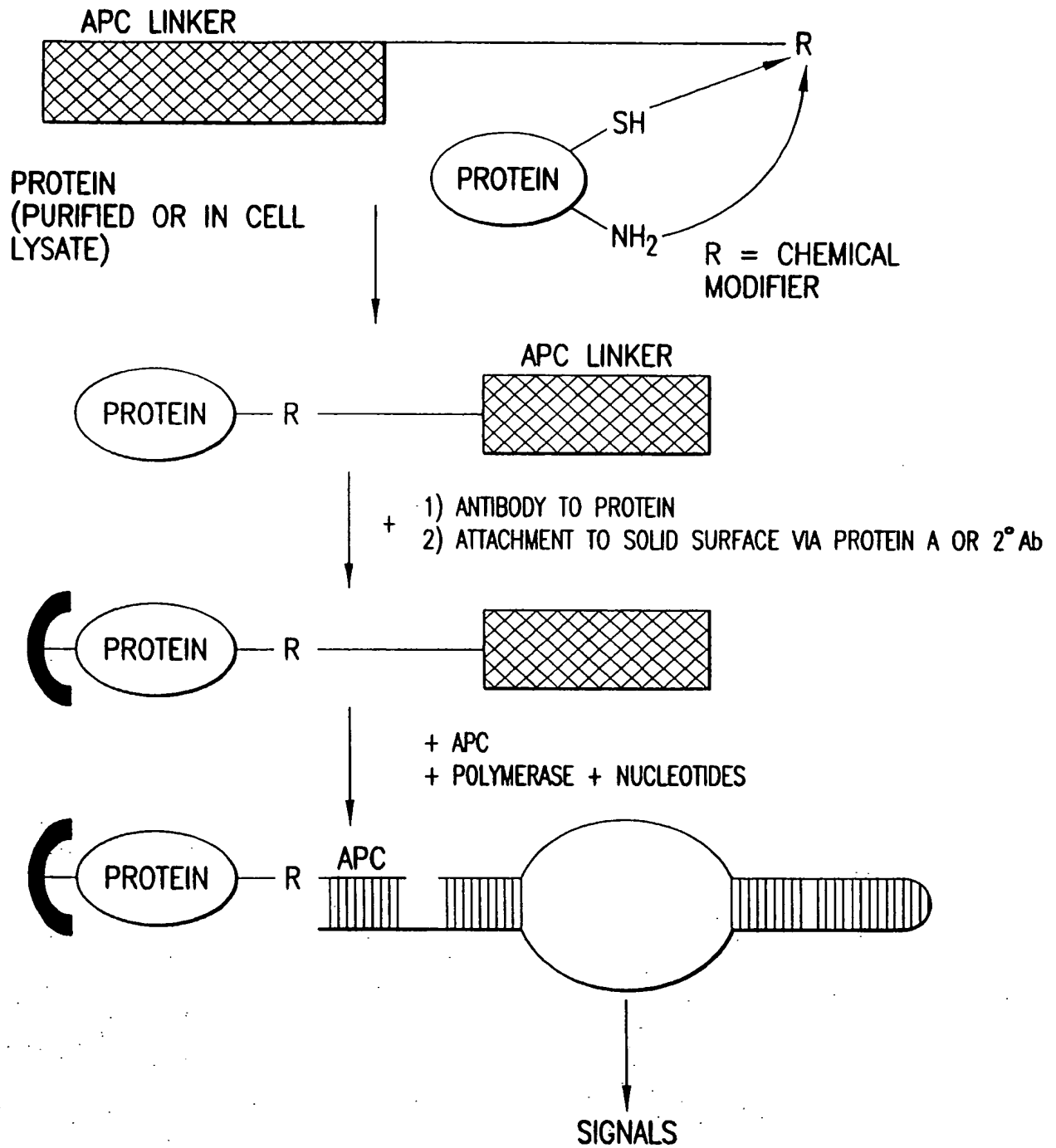


FIG.22

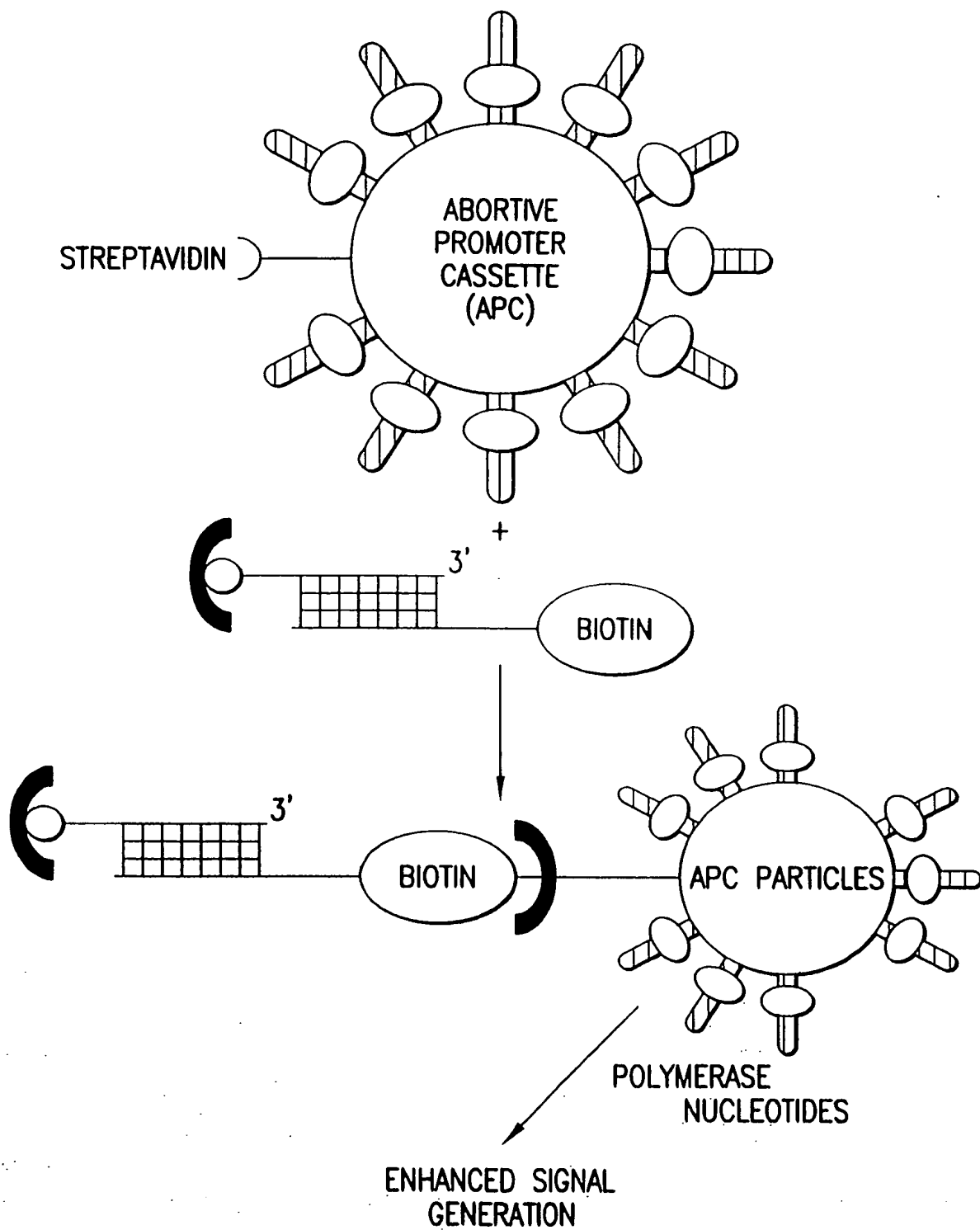


FIG.23

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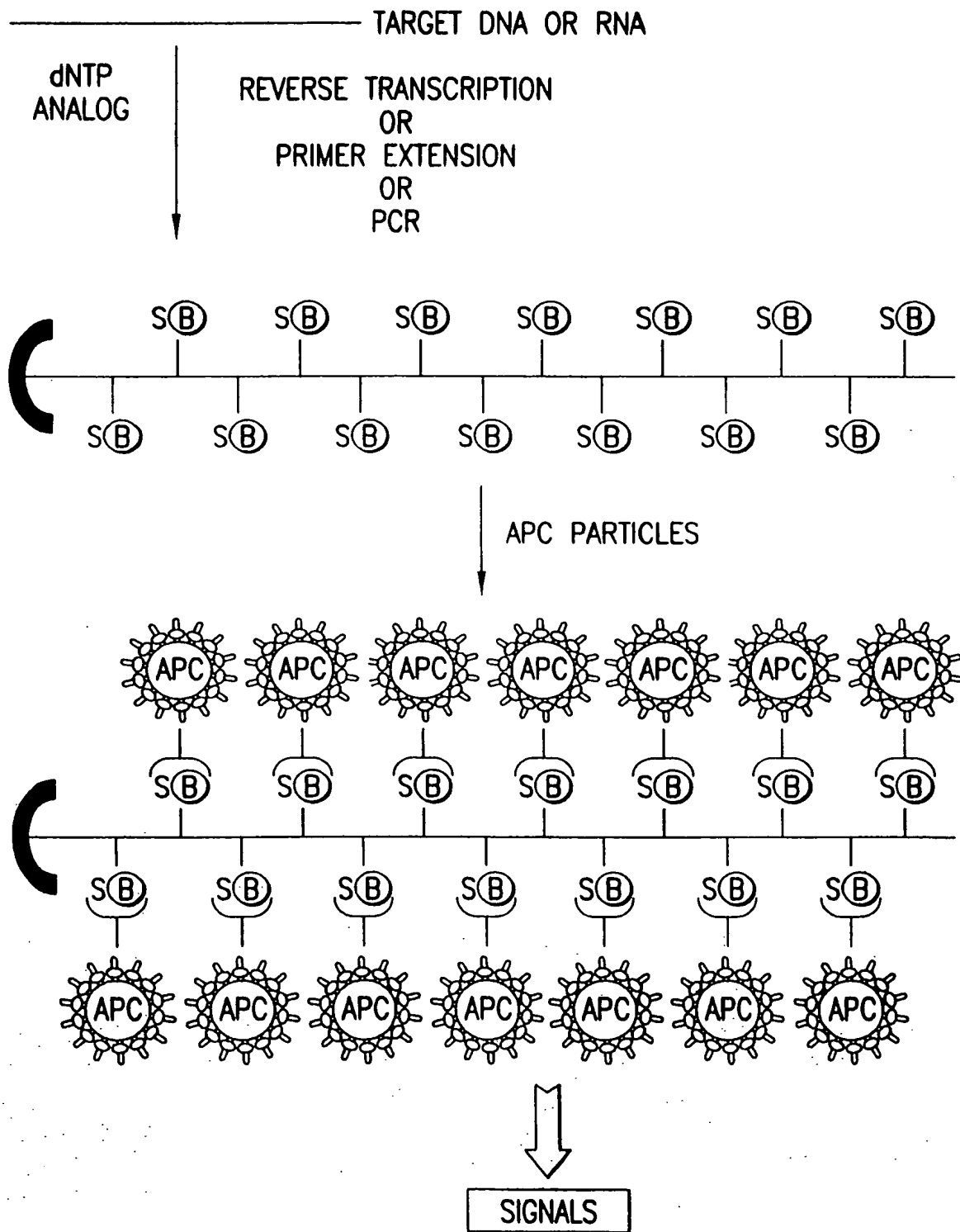


FIG.24



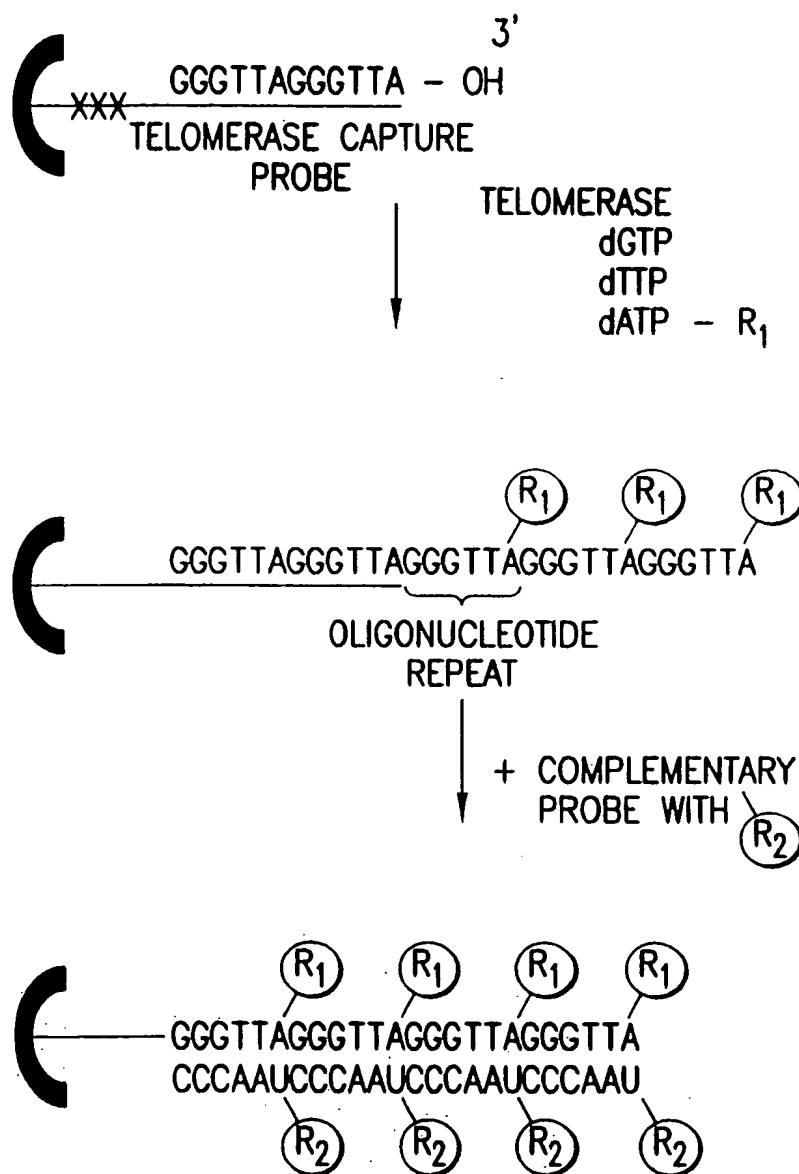


FIG.25

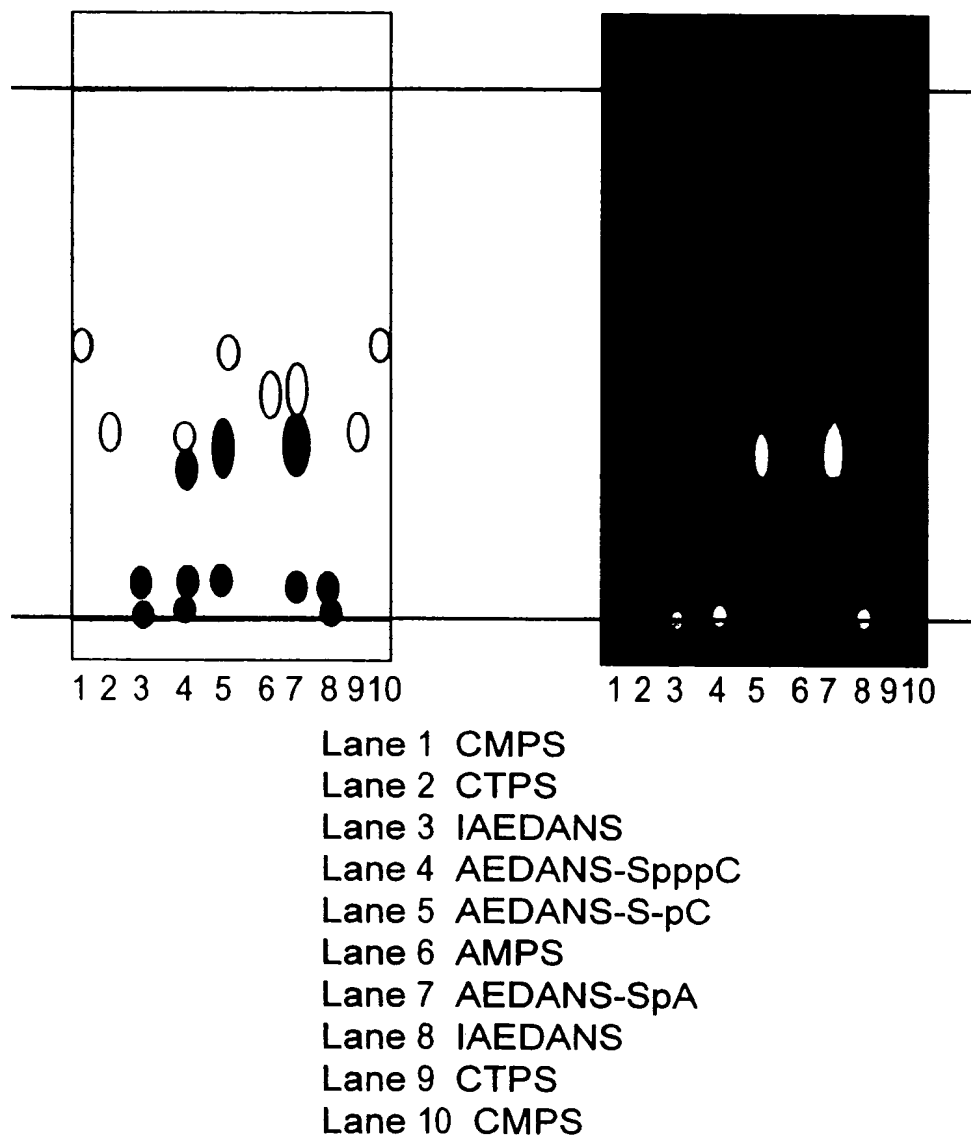


FIG.26

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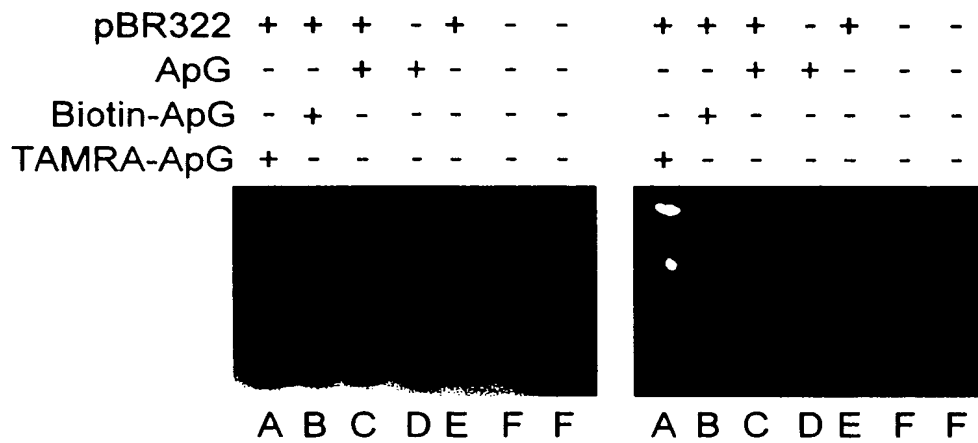


FIG.27

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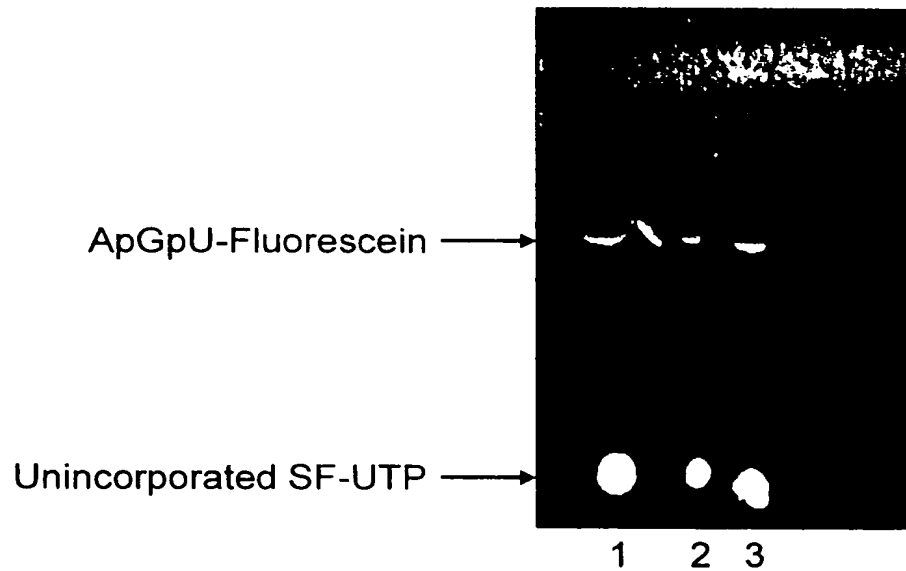


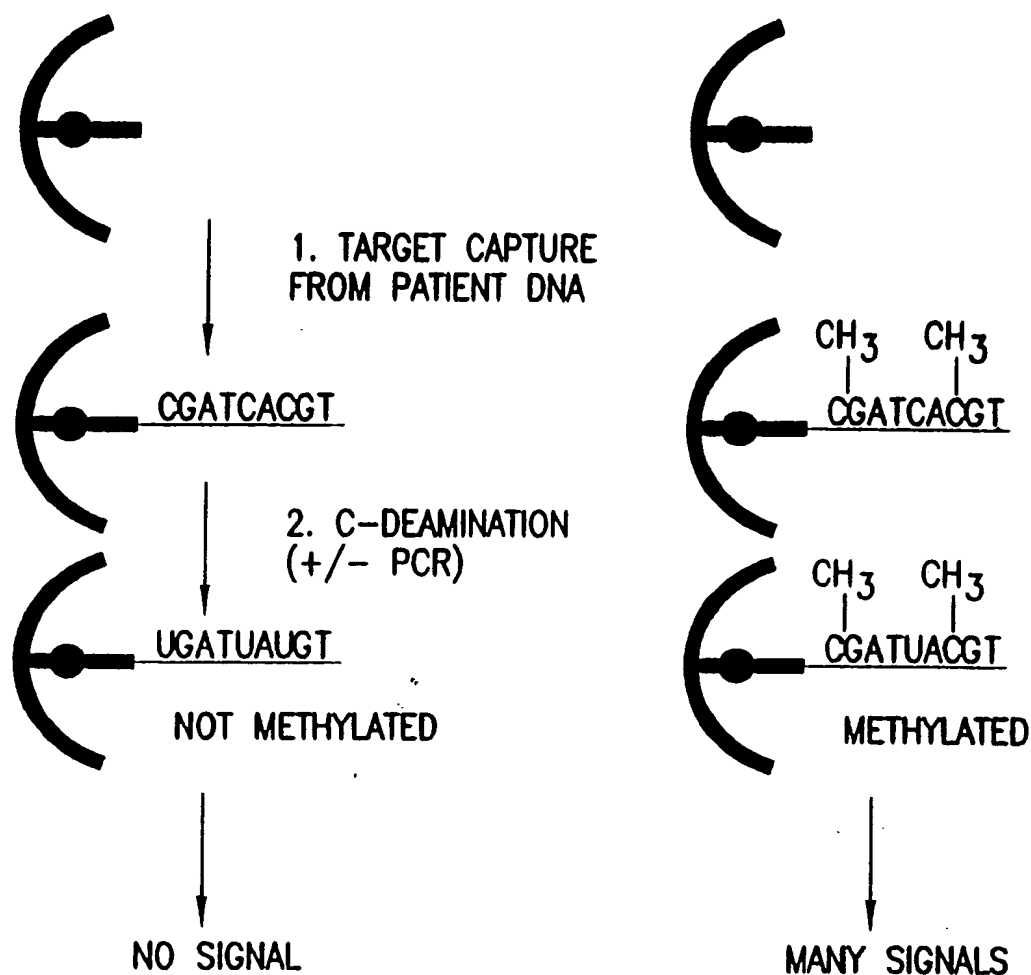
FIG.28

**FIG. 29A**

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GGTGTATGTTGGAATAAATATCGAATATAAATTTTGATCGAAATTATTCAGAAGCGGCCGGGCGGGTGCCTC  
ACGCCTTGTAATCCCTTCACTTTGGGAGATCAAGCGGGGGGAATCACCTGAGGTCGGGAGTTCGAGACCA  
GCCTGGCCAACAGGTGAAACCTCGCCTCTACTAAAAATACAAAAGTAGCCGGGGGTGGTGGCAGGCGCCT  
GTAATCCCAGCTACTCGGGAGGTTGAGGCAGGAGAATCGCTTGAACCCGGGAGGCTGAGGTTGTAGTGAAC  
AGCGAGATGGAGCCACTTCACTCCAGCCTGGGTGACAGAGTGAGACTTTGTGCGAAAGAAAGAAAGAGAGAA  
AGAGAGAGAGAAAAATTATTCAGAAGCAACTACATATTGTGTTTTATTTTAACTGAGTAGGGCAAATAAATATA  
TGTTTGCTGTAGGAACCTTAGGAAATAATGAGCCACATTCATGTGATCATTCCAGAGGTAATATGTAGTTACCAT  
TTTGGGAATATCTGCTAACATTTTGTCTTTTACTATCTTTAGCTTACTTGATATAGTTTATTTGTGATAAGAG  
TTTTCAATTCCTCATTTTTGAACAGAGGTGTTTCTCCTCTCCCTACTCCTGTTTTGTGAGGGAGTTAGGGGAG  
GATTTAAAAGTAATTAATACATGGGTAACCTTAGCATCTCTAAAATTTTGCCAACAGCTTGAACCCGGGAGTTTG  
GCTTTGTAGTCCTACAATATCTTAGAAGAGACCTTATTTGTTTAAAAACAAAAGGAAAAAGAAAAGTGGATAG  
TTTTGACAATTTTAAATGGAG

**FIG. 29B**



**FIG. 30**